

Spatial Distributions Of Tourist In Langkawi Island

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Langkawi Island is most competitive tourist destination in Malaysia. Tourism industry in Langkawi boost in late 1980's after this destination declared as free-duty Island. From 2005 until 2011, tourism industry in Langkawi Island always recorded the positive growth and the next development will continues in more intensive phase after Langkawi Tourism Blueprint launched in 8 December 2011. With mission the transform Langkawi as one among top 10 global islands and eco-adventure destination in 2015, the process of development in Langkawi will more focusing on product development, infrastructures and enablers. Langkawi Island formed by 104 different and because of that, this destination can offer many type of attractions started from its scenic beauty to natural heritage until to the legends story. The understanding of tourist distribution can provided the good information especially for tourism market segmentations in Langkawi. With the understanding, the location and allocation of tourism services and facilities can be optimized and it also can use as a basic of forecasting future tourist behavior. Generally, the knowledge about whereabouts of tourists assists in tourism development and planning. Using Spatial Analyst tools in Geographic Information Systems (GIS) ArcGIS 10 software, this paper tries to identify the most visited attractions by 500 tourists in Langkawi Island on 2011. From the 500 respondent, 35 attractions in Langkawi Island were visited.

Key words: tourism, tourist distribution, Langkawi Island, GIS

Introduction

Tourism industry is a one of main contributor to Malaysia incomes. In Tenth Malaysia Plan 2011-2015, tourism industry is one of the 12 National Key Economic Areas (NKEAs) which recognized have big potential to generate high income to country (Mohd Najib Abdul Razak, 2011). In 2011, tourism industry contributed RM 58.3 billion to Malaysia incomes and it was increased compare to receipts in 2010 which only RM 56.5 billion (Siti Shuhada & Normaz Wana, 2012; Borneo Post, February 11, 2012). From that amount, RM 1.9 billion was contributed by Langkawi in 2010

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and in 2011, the total was increase to RM 2.1 billion (Langkawi Development Authority [LADA], 2012). Generally, tourism industry in Malaysia showed the positive growth in term of tourist admission started 2006 until 2011 with increase from 1.81 million to 2.82 million tourists (Figure 1).

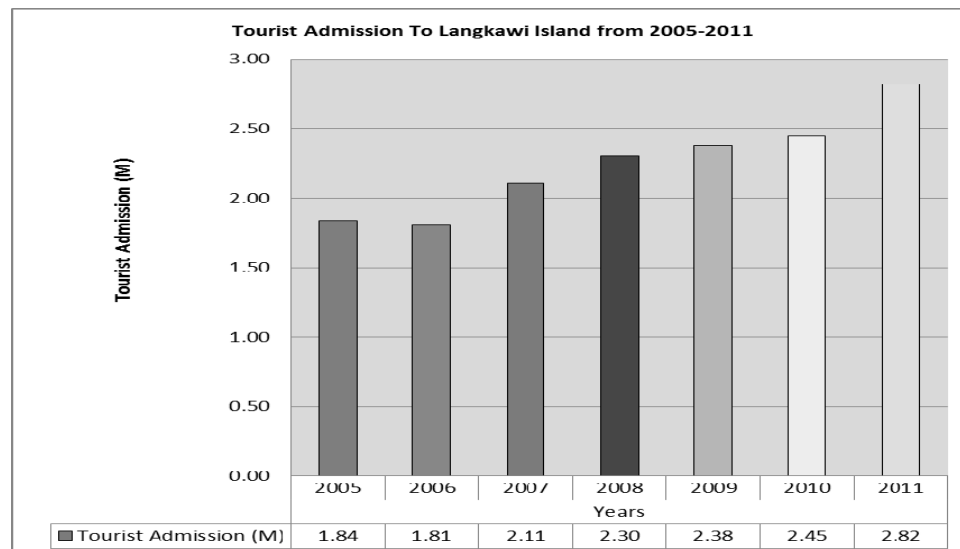
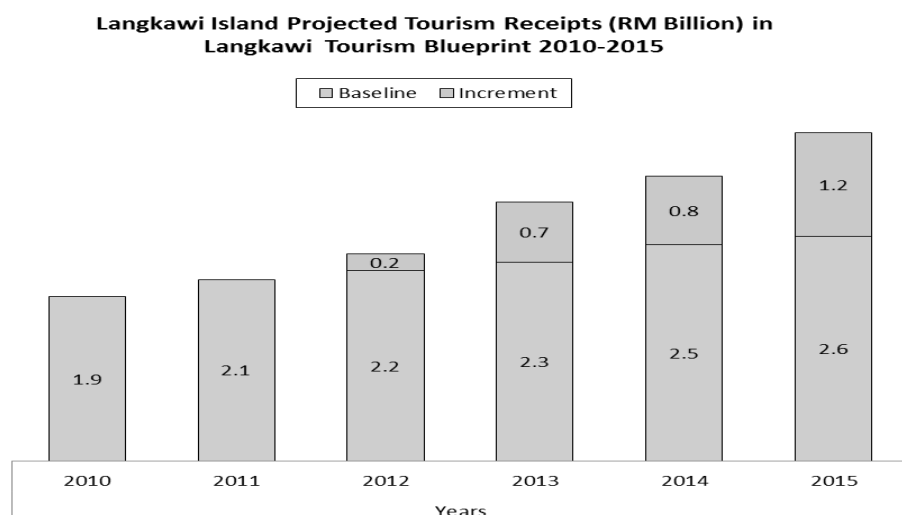


Figure 1: Tourist Admission In Langkawi Island From 2005-2011
(Source: LADA, 2012)

Status and functions of Langkawi as one of most popular destination in Malaysia seen will enhanced when Langkawi Tourism Blueprint 2011-2015 was launched on 8 December 2011 with the vision to transforms Langkawi as one of global top 10 islands and eco-adventure destinations in 2015. For achieve the goal, government had located RM 42 million under the 2012 Budget to undertake the development outlined in the blueprint. The implementation of the blueprint is expected to boost the island's tourism income in 2015 to RM 3.8 billion through three million tourist arrivals, besides making available 4,200 jobs (Bernama, December 8, 2011) (Figure 2).



Baseline refers to receipts assuming Blueprint is not implemented; Increment refers to additional receipts due to implementation of Blueprint

Figure 2: Langkawi Island Projected Tourism Receipts (RM Billion) In
Langkawi Tourism Blueprint 2010-2015
(Source: LADA, 2012)

Langkawi is one most competitive tourism destination in Malaysia and currently ranked the fourth best island in Asia by a poll done by Condé Nast Traveller (New Straits Times, October 31, 2012). This island is a part of Kedah State district and formed by 104 different islands which the main island was Langkawi Island with six different subdivisions. Langkawi Island located 30 kilometers from Kuala Kedah, 109 kilometers from Penang and adjacent to the Thailand border (Figure 3). The total land mass of this islands is 47,848.36 hectares which main island area was 32,000 hectares. Almost 90 percent from this islands covered by forest reserved area and agriculture land. Besides that 2/3 from this area was mountainous. Most of island was uninhabited, only Langkawi Island, Island of Pregnant Maiden and Tuba Island had the occupants (Langkawi District and land Office (PDL), 2011).

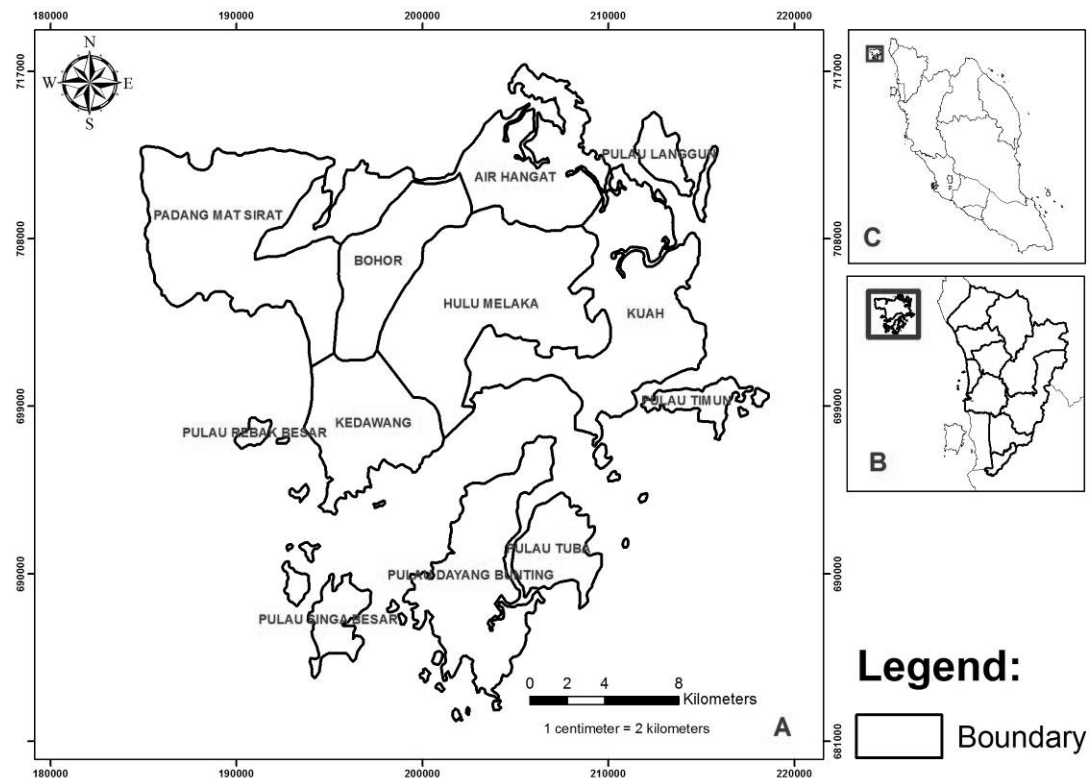


Figure 3: Langkawi Islands (A), The State of Kedah (B) and Peninsular Malaysia (C)

Tourism in Langkawi was boosted in late 1980's after this area declared as free-duty Island by former Prime Minister, Tun Dr. Mahathir Mohamad. Since that, Langkawi develop as most incredible tourist destination in Malaysia and recognized as 'Bandaraya Pelancongan' in 2001, 'Bandaraya Bersejarah' in 2002 and also as 'Langkawi Permata Kedah' in 2008. In 2007, Langkawi was given status as geopark area and it is first UNESCO National Geopark in South-East Asia (Langkawi Geopark, 2012). This island is famous for its scenic beauty, natural heritage and legends but its true potential has not been fully unleashed (Langkawi Municipal Council, 2005) Langkawi Island had many varieties in types of tourist attractions but the choices of destination depend on tourist motivations when their came to Langkawi (Figure 4).

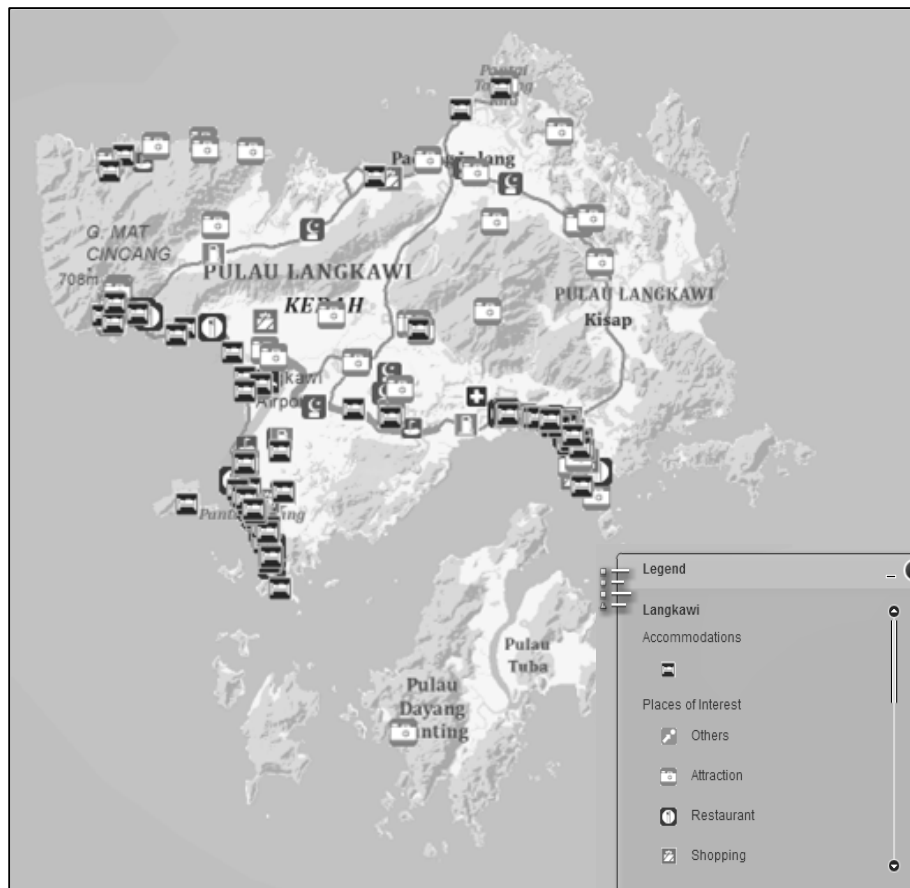


Figure 4: Langkawi Island Attractions
(Sources: Strcmap, 2012)

Methodology

In this study, random survey was conducted with 500 respondents who comes visited Langkawi Island on November 2011. The respondents were between 20 years old until above 65 years old also the domestic and international tourist. The questionnaire was divided to three different components. The objective of this survey was to indetnify the tourist movement in Langkawi Island. From all attractions in Langkawi, 35 attractions were listed by 500 respondents as one of their visited locations during their holiday in Langkawi.

Coordinate all the location was identified and database of tourist's frequency who visits the area was developed in ArcGIS 10 software. SPSS software was using to identify the tourist frequency. Using kernel and point density analyst in Spatial Analyst this paper tries to identify most visited place among 500 respondents. In Point density, frequency of tourist in each place of attractions was divided to five [5] different class which it low (1-85), medium low (86-170), medium (171-255), medium high (256-335) and high (336-420).

Literature Review

Avdimiotis and christou (2004) claim that GIS were recognized widely as a valuable tool for managing, decision making, analyzing and displaying large volumes of diverse data. Tourism also an activity highly depended on environmental resources and GIS will provide a toolbox of techniques and technologies of wide applicability

to achievement of sustainable tourism development. Bahaire and Elliot-White (1999) was categories capabilities of a GIS in tourism to seven [7] different class (Table 1).

Table 1: Capabilities of A GIS

Functional capabilities of a GIS	GIS Basic Questions		Tourism Applications
1. Data entry, storage and manipulation	1.Location	1. What is at?	1. Tourism Resource Inventories
2. Map production	2.Condition	2. Where is it?	2. Identify most suitable locations for development
3. Database integration and management	3.Trend	3. What has changed?	3. Measure tourism impacts
4. Data queries and searches	4.Routing	4. Which is the best route?	4. Visitor management/flows
5. Spatial analysis	5.Pattern	5. What is the pattern?	5. Analyze relationships associated with resource use
6. Spatial modeling	6.Modelling	6. What if...?	6. Assess potential impacts of tourism development
7. Decision support			

(Source: Bahaire & Elliot-White, 1999).

According to Luberichs and Wachowiak (2010), tourist flows and spatial distribution patterns are not random. The knowledge about whereabouts of tourists assists in tourism development and planning. With that knowledge, the location and allocation of tourism services and facilities can be optimized. For that, a survey with visitor in Majorca Island was conducted in 2005 with the objective to identify to what extent the capabilities of geospatial analysis can contribute to tourist consumer research will be investigated exemplified for the consumer group of German low-cost carrier passengers (LCCP) on the Spanish Island Majorca. From this study, researchers claim with GIS data from different sources can be brought together for exploratory and explanatory analysis. The explanations for the distribution pattern are important for the spatial development of the destination. The spatial distribution of tourists can use as a basic of forecasting future tourist behavior (Mill 7& Morrison, 1985).

Spatial analyst in ArcGIS 10 software was used to identify the patterns of tourist distribution. The Spatial Analyst extension in ArcGIS 10 software provides a rich set of spatial analysis and modeling tools for both raster (cell-based) and feature (vector) data. The Kernel Density tool calculates the density of features in a neighborhood around those features. It can be calculated for both point and line features. The Point Density tool calculates the density of point features around each output raster cell. Conceptually, a neighborhood is defined around each raster cell center, and the number of points that fall within the neighborhood is totaled and divided by the area of the neighborhood (ESRI, 2012).

Findings

From the survey, 35 attractions in Langkawi Island were visited by 500 respondents (Figure 5). The location of attractions was dispersing around Langkawi area with showed various type of attractions started from place with nature-based to historical dan legendary place until to human creation attractions like cable car, eagle square and so on. Using the Kernel density, nine [9] attractions from 35 attractions detected as the most visited locations in Langkawi Island. More than 50 respondents visited each place with The Kuah Town became the main focal point when 403 from 500 respondents already visited and will visit the area. After the Kuah Town, Mahsuri Tomb, Cable Car and Cenang Beach became most popular place among the 500 respondents. Other popular attractions in Langkawi Island following kernel density analyst result was Padang Matsirat, Underwater World, Eagle Square, Seven Wells Waterfall and also Lake of Pregnant Maiden (Figure 6).

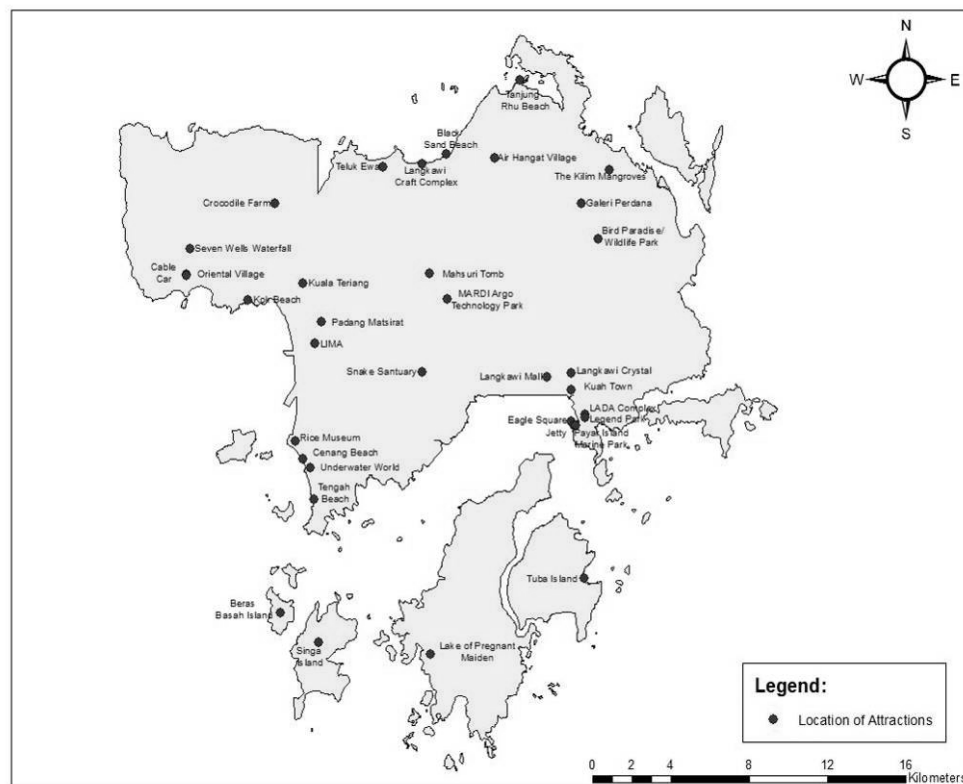


Figure 5: Distribution Of Attractions In Langkawi Island

In Point density analyst, Kuah Town and Mahsuri Tomb showed the high density meanwhile Cable Car and Cenang Beach showed medium high density with frequency of tourist whom visited this place between 256 until 335 tourists. None of the tourist attractions in Langkawi Island listed in medium density range. Padang Matsirat and Underwater World showed the medium low density and others 29 attractions were included in low density which number of tourist were visited all 29 attractions only between one [1] until 85 tourists (Figure 7).

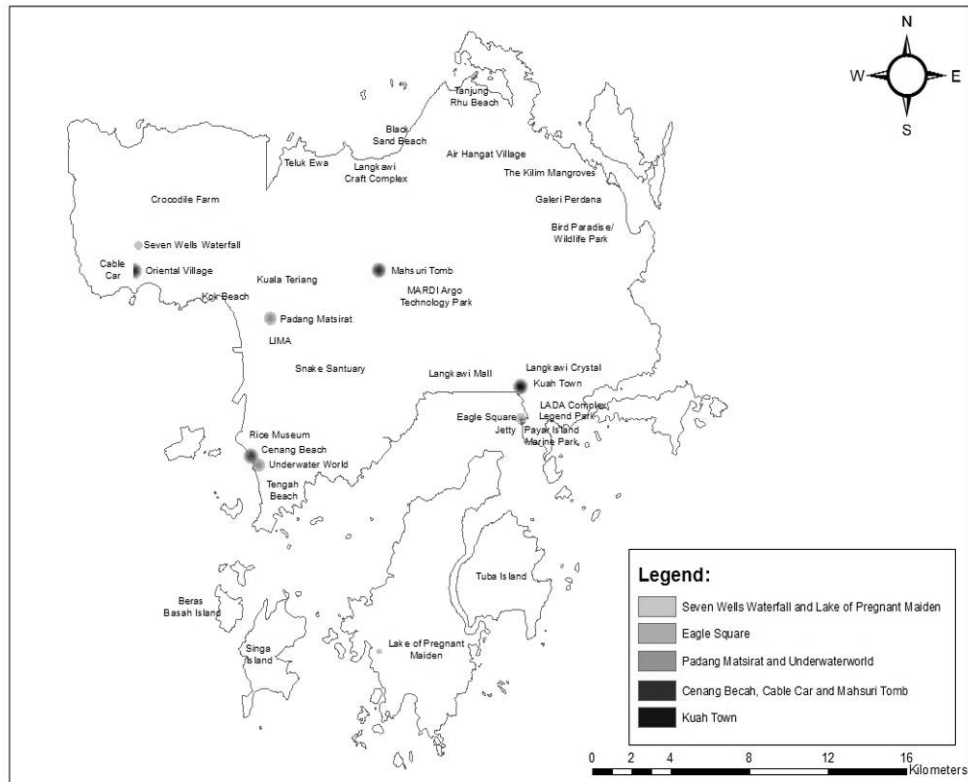


Figure 6: Spatial Distribution Of Tourist Using Kernel Density

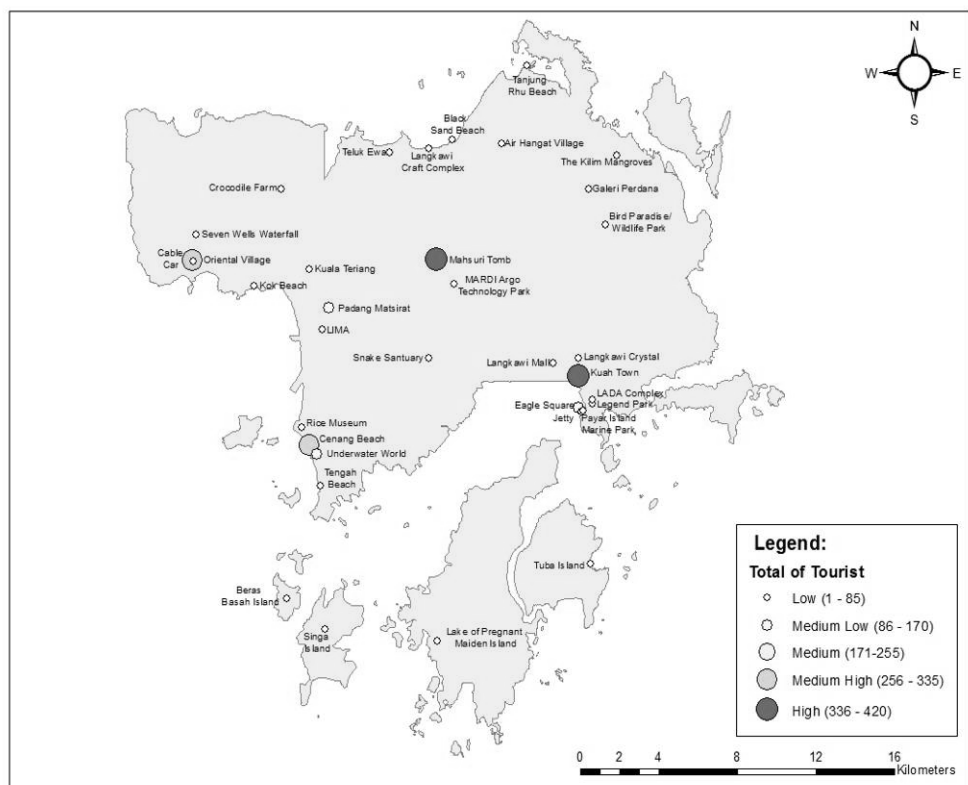


Figure 7: Spatial Distribution of Tourist using Point Density

Conclusion

Langkawi Island showed the blended type of tourist attractions started from nature scenic to legend story until human creation product made Langkawi emerge as one of incredible attractions in Malaysia. From 500 respondents, the result showed the iconic attractions become the most visited places in Langkawi Island. Kuah Town recognized as shopping place among the tourist and the status of free-duty Island give more advantage to this attraction. The iconic chocolate and other cheap thing for souvenirs becomes most important product to this town and also the reason why this place recorded the high number of visitor. Besides that, legend story about Mahsuri and the pregnant maiden has become cultural icon for Langkawi Island and this attraction becomes most valuable cultural product to Langkawi tourism industry. Beauty scenic in Cenang Beach and also the incredible structure and view of cable car also provided the very good prospect to tourism industry in this island.

However, the spatial distribution of tourist in Langkawi Island showed the concentrated pattern which only a few attractions becomes most visited place among respondents. This concentration will give the negative impacts for the place when the level of visitor use is greater than the environment's ability to cope with this use within the acceptable limits of change (United Nations Environment Programmed [UNEP], 2001). This scenario should be considered by those responsible because this situation will affect the life cycle of Langkawi tourism industry in future. Because of that, other attractions in Langkawi need more promotions and added-values to make sure all this attractions can become new identity to Langkawi. The proactive promotion to other attractions also can help to balancing the development around this island.

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